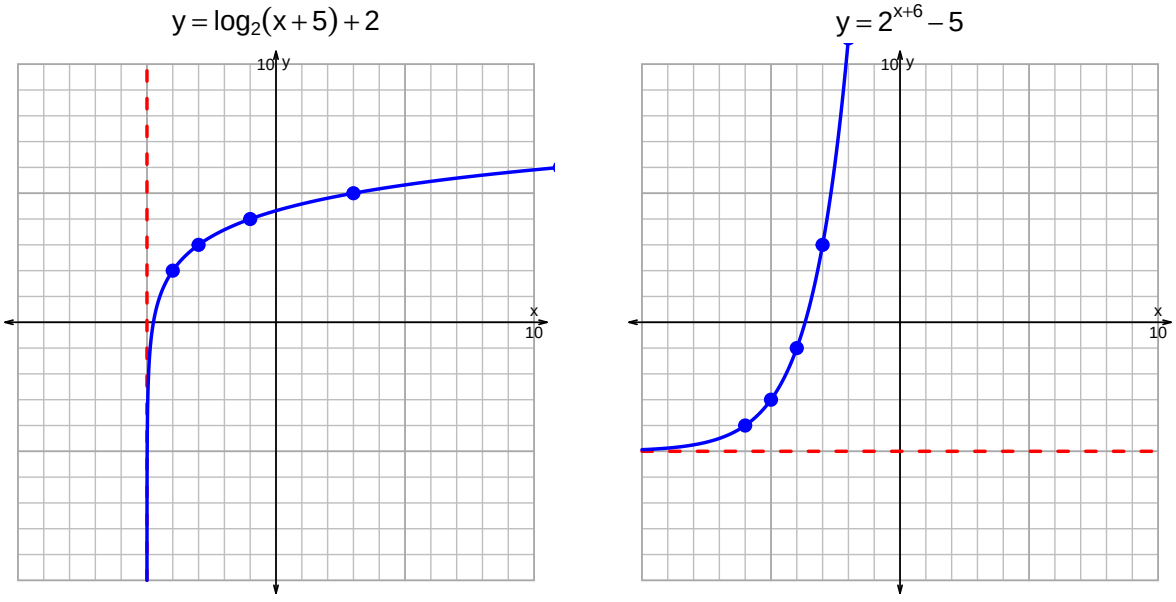
Name: Date:

s18: EXP LOG (SLTN v334)

1. (10 pts) Graph $y = \log_2(x+5) + 2$ and $y = 2^{x+6} - 5$ on the grids below. Also, draw any asymptotes with dashed lines.



Somewhat useful hint: $2^3 = 8$, *and thus* $\log_2(8) = 3$.

2. (10 pts) Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression. Please do not do any arithmetic; just move numbers around.

$$-23 = \left(\frac{-3}{7}\right) \cdot 10^{-5t/4}$$

Divide both sides by $\frac{-3}{7}$.

$$\frac{23 \cdot 7}{3} = 10^{-5t/4}$$

Take log, base 10, of both sides.

$$\log_{10}\left(\frac{23 \cdot 7}{3}\right) = \frac{-5t}{4}$$

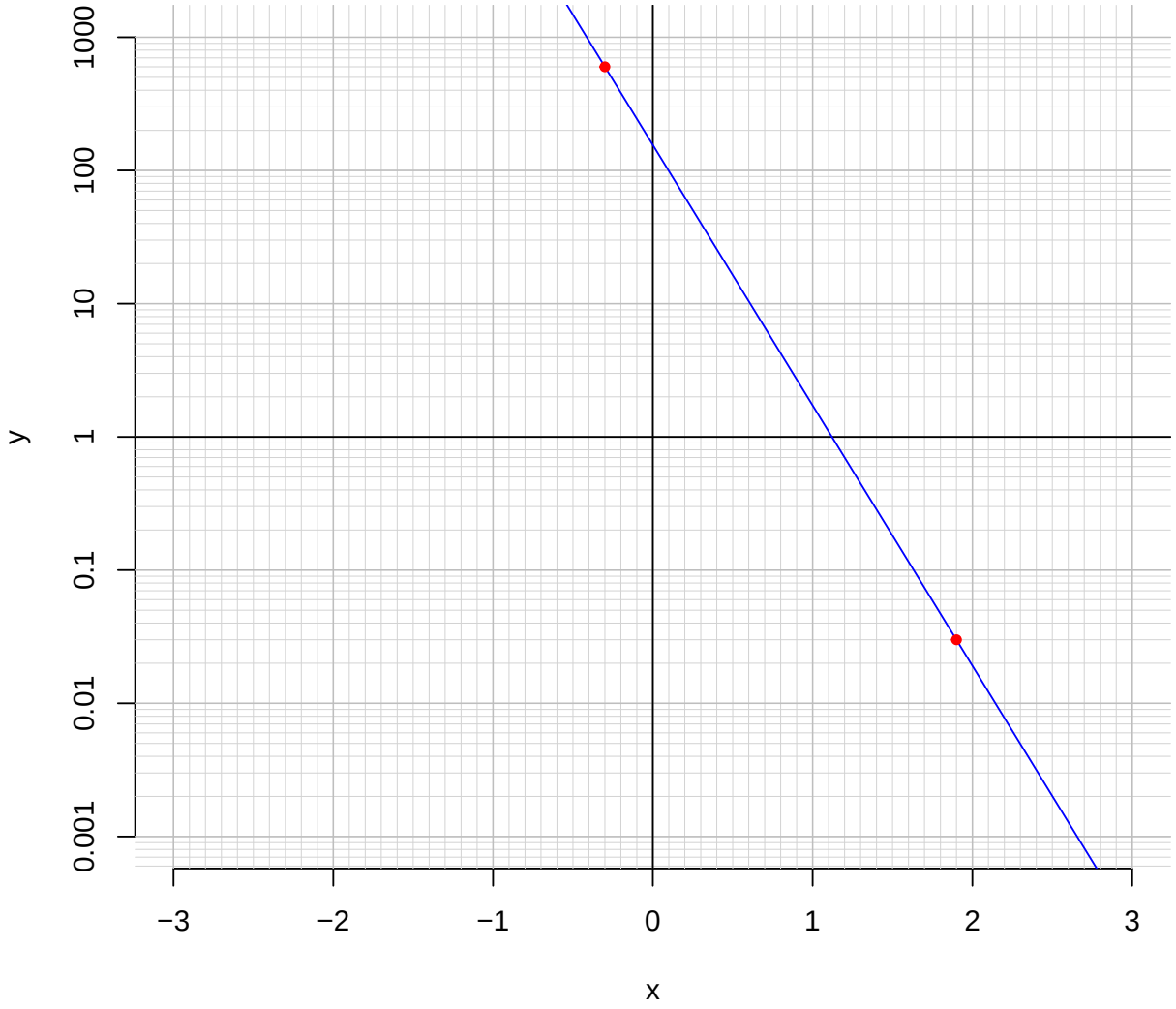
Divide both sides by $\frac{-5}{4}$.

$$\frac{-4}{5} \cdot \log_{10}\left(\frac{23 \cdot 7}{3}\right) = t$$

Switch sides.

$$t = \frac{-4}{5} \cdot \log_{10}\left(\frac{23 \cdot 7}{3}\right)$$

3. (10 pts) An exponential function $f(x) = 155 \cdot e^{-4.5x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(1.9)$.

$$f(1.9) = 0.03$$

b. The inverse function is logarithmic.

$$f^{-1}(x) = \frac{-1}{4.5} \cdot \ln\left(\frac{x}{155}\right)$$

Using the plot above, evaluate $f^{-1}(600)$.

$$f^{-1}(600) = -0.3$$